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Since those measurements, the author has obtained another section, extending from Namthabad to Daumergidda, in the Nizam's dominions, which being in latitude  $18^{\circ} 3' 23'' \cdot 6$ , gives a total arc of  $9^{\circ} 53' 45'' \cdot 14$  in amplitude.

From the first of these sections, Colonel Lambton finds the length of the degree due to latitude  $9^{\circ} 34' 44''$  (the middle point of that arc), equal to 60472·83 fathoms. The second section, whose middle point is in latitude  $13^{\circ} 2' 55''$ , gives the mean degree equal to 60487·56 fathoms; and the last section gives the degree equal to 60512·78 fathoms due to the latitude of  $16^{\circ} 34' 42''$ , the middle point of that section.

The author proceeds to compare each of these degrees, first with the French measure, then with the English, and lastly, with the Swedish measure, and thence obtains a general mean for the compression at the poles. The first mean of these three degrees, used with the French degree, gives the compression  $\frac{30 \frac{1}{2} \cdot 15}{1000000}$ ; the second mean of the same three degrees, used with the English degree, gives  $\frac{31 \frac{1}{2} \cdot 34}{1000000}$ ; and the third mean of these three degrees, used with the Swedish degree, gives  $\frac{30 \frac{1}{2} \cdot 15}{1000000}$ ; so that the mean of these three means will give the compression  $\frac{30 \frac{1}{2} \cdot 36}{1000000}$ , or  $\frac{31}{1000000}$  nearly of the polar axis.

The number of base lines in this extensive arc are five, all measured with the chain extended in coffers, with elevating screws, &c.

The author, after giving a variety of data, proceeds to investigate the formulæ which he has employed in his calculations, and concludes with a table of the lengths of different degrees for every third degree from the equator to the pole.

*The Croonian Lecture. On the Conversion of Pus into Granulations or New Flesh. By Sir Everard Home, Bart. V.P.R.S. Read November 5, 1818. [Phil. Trans. 1819, p. 1.]*

The changes which pus undergoes in the formation of new flesh are so analogous to those which take place in the blood, and which were discussed in the author's Croonian lecture of last year, that he is induced to consider the two fluids as possessed of the same properties, the colour of the globules being the principal characteristic distinction between them.

That pus is a transparent fluid, in which globules are subsequently formed, was proved by the author in 1788; and in July 1817 Mr. Bauer observed the same property in the serum of the blood: he saw globules forming in that fluid while he was examining it in the field of the microscope. Human blood, sheep's blood, and calves' blood, presented to Sir Everard similar results; the serum of which, when warm and fresh, was observed, in a space covering  $\frac{1000 \cdot 000}{1000000000}$ th part of an inch, to produce from six to twelve globules in a few minutes, two only being observed in the first instance.

The author, after detailing further experiments on the formation of globules in the serum of the blood, proceeds to examine the changes which happen in pus upon the surface of a sore, having previously

described the appearance of the surface immediately under the newly secreted pus. It was made up of eminences and hollows; the former consisting of clusters of tortuous blood-vessels, the latter filled with pus. After a few minutes' exposure, the following changes were observed: a transparent pellicle covered the surface, under which globules of air made their appearance in different places; then horizontal anastomosing canals, filled with red blood, were seen to form; and red spots, which were the termination of perpendicular canals, were observed under the pellicle. Drawings illustrating these appearances accompany the paper.

After detailing further proofs and illustrations of the above phenomena, presented by the surfaces of sores covered with pus, Sir Everard observes, that the carbonic acid originally contained in the tubes is very readily displaced by the blood, in consequence of its disposition to absorb that particular gas which forms so large a proportion of its component parts. He thinks that the extrication of carbonic acid is the original cause of the tubularity of pus; and that the tubes are then filled with red blood, and thus connected with the circulation. The succeeding changes are illustrated by Mr. Bauer's drawing, which the author laid before the Society last year.

*On the Laws which regulate the Absorption of Polarized Light by Doubly Refracting Crystals.* By David Brewster, LL.D. F.R.S. Lond. and Edinb. In a Letter addressed to the Right Hon. Sir Joseph Banks, Bart. G.C.B. P.R.S. Read November 12, 1818. [*Phil. Trans.* 1819, p. 11.]

In examining the polarizing structure of acetate of copper, the author's attention was drawn to certain changes of colour exhibited by its crystal, when exposed in different positions to polarized light; and as these were independent of the thickness of the plate, and of any analysis of the transmitted pencil, he was induced to regard them as a new affection of light, ascribable to the absorption of the homogeneous tints forming the compound colour of the crystal. Dr. Brewster, therefore, collected a variety of coloured crystals, with a view to examine the phenomena which they presented, when cut at different angles with the axis, and when exposed in different positions to polarized light. The details of this examination are next given; and as the property of transparent bodies, by which they detain and assimilate to their own substance a portion of the rays which penetrate them while the rest are freely transmitted, is related to the axes of double refraction, the author first describes the phenomena presented by crystals of one axis, and then explains the modifications which they undergo when the number of axes is increased.

It appears from these investigations that the colouring particles of crystals, instead of being indiscriminately dispersed throughout their mass, have an arrangement related to the ordinary and extraordinary forces which they exert upon light. In some cases, the extraordinary